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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/126,683	07/30/1998	BRUCE ANTHONY BEADLE	AT9-98-303	9195

7590   05/09/2002

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EXAMINER
ANYA, CHARLES E

ART UNIT	PAPER NUMBER
2151	

DATE MAILED: 05/09/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3/* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____ .

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☐ Claim(s) *10-26* is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☐ Claim(s) *10-26* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

     If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☐ All b) ☐ Some * c) ☐ None of:

         1. ☐ Certified copies of the priority documents have been received.

         2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

     a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 10 – 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over

U.S. Pat. No. 6,226,789 to Tye et. al. in view of Miller et. al.

As to claim 10, Tye teaches a Method (Routine A, Routine B), a Data Processing

System (Computer System 10), a Stack (Guest Return Stack 211, Shadow Stack 212),

a Privilege (Call B, Call B'), Stack Frames (Frame 219, Frame 214), a Stack Frame

Pointer (Dynamic Link 220d, Col. 28, Ln. 32 – 41), a Link List (Dynamic Link 220d, Col.

29, Ln.62 – 66), a Stack Frame Extension (Shadow Stack 212, Col. 30, Ln. 3 – 6). Tye

is silent with reference to run-time environment, a current thread and a thread identifier.

Miller teaches a Run-Time Environment (Run-Time Environment 122), a Current Thread

(Thread 204), a Thread Identifier (Thread 204).

It would have been obvious to apply the teaching of Miller to the system of Tye. One

would have been motivated to make such a modification so that the method and current

thread can be used to access the shadow stack.

As to claim 11, Tye teaches a Stack Frame Shadow Apparatus (Shadow Stack 212), a Plurality of Link List (Dynamic Link 220d, dylnk, Col. 29, Ln. 62 – 66). Tye is silent with reference to a thread.

Miller teaches a Thread (Thread 204). It would have been obvious to apply the teaching of Miller to the system of Tye. One would have been motivated to make such a modification since every stack frame must have an associated thread.

As to claim 12, Tye teaches a Stack Frame Extension (Shadow Stack 212) comprising of the stack frame pointer (Dynamic Link 220d), Privilege Information (SP 220a, IP 220b, RET 220c), and Validation Information (SP 220a, IP 220b, RET 220c).

As to claim 13, Tye teaches the validation information to comprise of the return address of the method (RET 220c).

As to claim 14, Tye teaches adding an entry to the link list if no matching entries are found in response to a request to enable a privilege for the method ("...shadow frame 214 are pushed onto the shadow stack 212...", Col. 28, Ln. 65 – 66 and Col. 29, Ln. 1 – 7).

As to claim 15, Tye teaches removing a matching entry ("...location 220a...location 220b...", Col. 30, Ln. 3 – 40, path 256a, path 256b, path 258a, path 258b, path 252a, path 252b, Col. 31, Ln. 1 – 28).

As to claim 16, Tye teaches retrieving privilege information and validation information ("...location 220a...location 220b...", Col. 30, Ln. 3 – 40, path 256a, path 256b, path 258a, path 258b, path 252a, path 252b, Col. 31, Ln. 1 – 28).

As to claim 17, claim 1 meets claim 17 expect for storing privilege information, querying a stack frame shadow apparatus, deleting privilege information in a stack frame shadow apparatus to revert a privilege for a method and a method.

Tye teaches Storing privilege information ("...Shadow Frame is allocated...", Col. 29, Ln. 44 – 54), Querying a stack frame shadow apparatus ("The shadow instruction call B' causes the shadow stack to be provided...", Col. 29, Ln. 45 – 54) and Deleting privilege information in a stack frame shadow apparatus to revert a privilege for a method ("...revert...", Col. 29, Ln. 14 –19). Tye is silent with reference to a rum-time environment.

Miller teaches a Run-Time Environment (Run-Time Environment 122). It would have been obvious to apply the teaching of Miller to system of Tye. One would have been motivated to make such a modification in order utilize the efficiency of a run-time system.

As to claim 18, Tye teaches a Data Structure (Shadow Stack 212), a Computer-readable medium (Main Memory 14, Disk 15, Disk 17), a Data Processing System (Computer System 10), a Set of stack frame extensions (Shadow Stack 212), a Pointer (SP 220a, dylnk 220d), a Stack Frame (Frame 214), a Method (Routine A, Routine B), a Data Field (SP 220a, IP 220b, RET 220c, dylnk 220d), and a Link List (dylnk 220d). Tye is silent with reference to a thread identifier.

Miller teaches a thread indentifier (Thread 204). It would have been obvious to apply the teaching of Miller to the system of Tye. One would have been motivated to make such a modification in view of the fact that every thread has an associated stack frame.

As to claim 19, see the rejection of claim 1.

As to claim 20, see the rejection of claim 11.

As to claim 21, see the rejection of claim 12.

As to claim 22, see the rejection of claim 13.

As to claim 23, see the rejection of claim 14.

As to claim 24, see the rejection of claim 15.

As to claim 25, see the rejection of claim 16.

As to claim 26, see the rejection of claim 1.

Conclusion

1.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Pat. No. 6,009,517 to Bak et. al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles E Anya whose telephone number is (703) 305-3411. The examiner can normally be reached on M – F (First Friday Off) from 8:30 am to 5:30 pm.
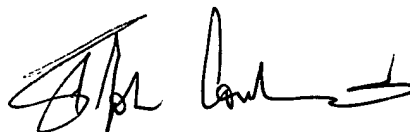
The fax phone number for the organization where this application or proceeding is assigned is (703) 746-7239.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Charles E Anya
Examiner
Art Unit 2151

ST. JOHN COURTENAY III
PRIMARY EXAMINER